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is nearly a thing of the past; while the annual output of the Alaskan Yukon is nearly $1,000,000.

The tin deposits of the York region are discussed by Mr. Arthur J. Collier. Stream tin was found several years ago, and lode tin was discovered in 1903. Most of the ore is cassiterite, which is said to be irregularly distributed through an area of 450 square miles, occurring in placers and in lodes. Little has been done in the way of development. All the deposits are near tide-water, and deserve to be carefully investigated.

The Cumberland Gap coal field receives notice by Mr. George H. Ashley. The field belongs to the eastern edge of the Appalachian coal-belt of Kentucky and Tennessee. It has the Cumberland Range on the southeast and the Pine Mountains on the northwest. The drainage is by the Cumberland River through Pineville Gap. The rocks containing the coals are shales and sandstones, and structurally form a flat-bottomed syncline. In Log Mountains are at least forty coal beds, thirteen of them being thick enough for working. Most of the area is not yet tapped by railways, and only recently have roads been built to Middlesboro, which lies just outside the Cumberland Gap from the Great Valley. The product about that centre runs annually from 600,000 to 1,000,000 tons. With the notices of coal, as of many other products, is included a bibliography of the various papers upon the respective subjects published by the Geological Survey. This makes the *Bulletin* a convenient summary of the Survey's operations and a useful guide to its economic literature. A. P. B.

GEOGRAPHICAL RECORD.

AMERICA.

A NEW HARBOUR IN PORTO RICO.—Mr. J. C. Landers, of the Coast and Geodetic Survey, describes another good harbour in Porto Rico, revealed by the work of the Survey. Although every good harbour in Porto Rico has, doubtless, been long known to fishermen and local traders, the cartographers knew nothing about Ensenada Honda, Jobos, or Guayanilla until the detailed hydrographic surveys of the Coast Survey were published. The harbour now added to the list is Boqueron Bay, which has just been surveyed. It is ten miles to the south of Mayaguez, and four miles north of Cabo Rojo, the southwestern point of Porto Rico.

The bay is an indentation in the coast, about two miles deep and two miles wide at the mouth. It is protected by a coral reef across the mouth, through which two passages lead into the harbour. The northernmost has a channel of over four fathoms, while the passage just south of the middle of the reef has a depth of six fathoms. Once inside, good holding-ground of not less than four fathoms is found over an area about 1½ square miles. The water shoals towards the head of the bay, where the small town of Boqueron is situated. This forms the commercial outlet for the valley of the Borinquen River, and of the region as far back as the town of Lajas. This tributary region produces important quantities of sugar, molasses, and cocoanuts.

DELTA PLAINS OF THE NASHUA VALLEY, IN MASSACHUSETTS.—Rarely is an opportunity given to study the glacial geology of an area in such intimate detail as that supplied by the work of the Metropolitan Water Board of Boston, in its preliminary investigations on the site of the Wachusett Reservoir. In an area of 9,000 feet long and 2,000–3,000 feet wide, more than 1,131 borings were made to depths averaging 83 feet, and in some cases reaching nearly 300 feet. Altogether, 10,000 samples from these borings were collected. The records and samples, as well as the excavations, have been carefully studied by Professor Crosby, who has recently published a detailed report, describing the condition revealed and discussing the origin of the phenomena (Technology Quarterly, XVI, 1903, 240–254, and XVII, 1904, 37–75).

This paper is an important contribution to our knowledge of the internal structure of delta plains built along the margin of the receding ice-sheet; and both the description of the borings and photographs of sections revealed in the course of excavation give us a clear idea of the internal structure of these interesting topographic forms. As in other places, the surface of the delta plains is pitted by kettle-shaped depressions, some of which Crosby shows must certainly have been caused by the stranding of ice-blocks during the construction of the deltas. R. S. T.

THE THOUSAND ISLAND REGION.—The peculiar condition at the outlet of Lake Ontario, where the St. Lawrence River sluggishly flows out between numerous islands with no single well-defined valley, has attracted the attention of physiographers, as its exquisite beauty has drawn to it streams of tourists and summer residents. A mere glance suffices to show the physiographer that it is not a normal river valley, but a gently-undulating hilly surface flooded by the waters of Lake Ontario, which thread their way over numerous low divides before gathering into a single stream. Only since the glacial period has this region been occupied by a large river, which has not had time enough to settle down to a single channel and develop a valley for itself.

What the exact preglacial condition of this region was has never been determined. Therefore any contribution to the subject is of decided interest. A recent paper by Wilson (Bull. Geol. Soc. Amer., XV, 1904, 211–242) calls attention to certain topographic features of the region which lead him to offer an interpretation of a part of the preglacial history. He points out that, although the River Trent flows by irregular course toward the southeast, while the St. Lawrence flows towards the northeast, there is, throughout the region from the Black River in New York to Sougog Lake in Canada, a general system of valleys extending toward the southwest. Certain sections of the Trent River are in these old valleys; while other sections are along lines of overflow between neighbouring valleys with southwest trend. The irregular Bay of Quinte is made by the union of nine of these streams by the rise of the Ontario waters; and three of the channels of the St. Lawrence overflow are along the lines of northeast-southwest valleys. Some of these valleys extend out under the lake waters, and their presence on the lake bottom is indicated by soundings. This system of streams is believed by the author to have formed a trunk river, now dismembered, which flowed westward, past Hamilton, Ontario, to the Erie lowland *via* the Dundas valley.

The author does not specifically attempt to solve the problem of the origin of Lake Ontario; but he brings forward evidence seeming to prove that ice erosion was not effective enough to cause the basin. If his southwest system of valleys is demonstrated, and if ice erosion is eliminated, it seems necessary to have recourse to differential land movements to account for the basin. This paper is a very decided contribution to the understanding of a complicated problem; and while numerous questions arise which it does not answer, it is undoubtedly an important step towards the solution of the problem. R. S. T.

END OF THE MORRIS CANAL.—The famous Morris Canal in New Jersey has been practically condemned in a report to the Governor. The Commissioners say that even were the property in perfect condition it could not be operated at a profit. Its decline in value is due to the powerful competition of railroads that carry freight at cheaper rates than can be done by canal boat. The result is that nearly all the traffic was diverted from the canal. At present the canal stands in the way of needed public improvements, and its abandonment is assured. The Canal Company, incorporated in 1824, built this waterway from Philipsburg on the Delaware River to Jersey City—a distance of 106 miles. It was leased in 1871 to the Lehigh Valley Railroad Company, which has since operated it.

EUROPE.

LIMNOLOGY IN EUROPE.—The *Geographical Journal* for August summarizes the laborious compilation of the results attained in Europe by the Lake surveys of recent years by Dr. W. Halbfass, in the *Zeitschrift* of the Berlin Geographical Society (1903, Nos. 8, 9, 10; 1904, No. 3). The work brings together, into small compass, a vast amount of data, and shows the exact state of our present knowledge of European lakes. No fewer than 873 lakes are included; but the gaps in our knowledge are still striking, especially as regards the lakes of northern Europe. The lakes in the Alpine countries are best known, though Sir John Murray's survey of British lakes will give that country a high place. Many Alpine lakes, however, require more detailed examination. Spain is not rich in lakes; but a considerable amount of work is to be done there, as is the case also in Greece. On the other hand, the examination of the lakes of the more northern part of the Balkan Peninsula is proceeding satisfactorily through the labours of Oestreich, Cvijic, and others.

At the close of his monograph, Dr. Halbfass groups into five tables the lakes which head the list in depth, volume, etc. Of 27 lakes which, as far as we know, have a depth of 200 metres (656 feet) and over, 14 (including the four deepest) belong to the Scandinavian Peninsula, 10 to the Alps or their borderlands, 2 to Scotland, and 1 to Macedonia. All the deep lakes of Europe lie either on the margin of important mountain ranges or in regions of geological subsidences, and almost all the deepest occupy depressions reaching below sea-level.

In Scotland and Norway many of the deepest lakes have their surfaces only a little above sea-level, and the difference between these and fiords is very slight. Of the high-level lakes (among which much work still remains to be done), the deepest thus far known seems to be Lac Bleu, in the Pyrenees (6,457 feet above the sea), with a depth of 396 feet; but probably this may be exceeded in Norway. Both for volume and extent of shore-line Onega takes the first place, the Scandinavian lakes Wener and Mälar following next—the first in respect of volume, the second of shore-line, while Mälar shows the greatest proportional development of shore-line of all the European lakes. For steepness of sides, the Königs-See takes the highest place, Loch Katrine the second, among lakes which exceed 1 square kilometre in area.

The House of the Royal Geographical Society.—In his last address to the Royal Geographical Society, the President, Sir Clements R. Markham, said the work of the Society had so far increased during the past 30 years that the present premises were too small for its requirements. A handsome price had been offered for the present house, but in addition to that sum a far larger amount would be required to obtain a freehold site and erect a suitable building. Several sites had been offered, but the Council did not feel justified in taking further steps until most of the amount required (about $600,000) is subscribed. Meantime a Special Committee is considering the question of increasing the accommodations.

Position of Geography at Cambridge.—The Cambridge authorities have decided to establish a Board of Geographical Studies to draw up a geographical course, take steps to procure a competent staff to cover the whole field of the science, and especially to train young University men for practical work in the field. The staff of the new Geographical School will consist of several lecturers and teachers. A diploma in geography will be granted, as at Oxford, and geography will be introduced into the examination for the B.A. degree.

London Fogs.—At the request of the London County Council the Meteorological Council of the Royal Society, three years ago undertook an inquiry into London fogs during the winter of 1901-02, the results of which have been reported to the Meteorological Council by Captain A. Carpenter, who had charge of the investigation. The observations were made chiefly by officers of the Metropolitan Fire Brigade. The fog frequency on days of the week is shown in the following table:

Friday	163	Wednesday	139
Saturday	143	Tuesday	112
Sunday	143	Monday	87

The hours of the beginning of fog formation on 43 occasions were as follows:

Midnight to 1 AM	3	9 A.M. to 10 A.M.	2
5 A.M. to 6 A.M.	8	5 P.M. to 10 P.M.	7
7 A.M. to 8 A.M.	23		

The London fogs were dispersed when the wind at Kew reached a velocity of 13 miles an hour, with the exception of the very smoky fogs which accompanied the damp air of advancing cyclones. These seemed to require a force of about 17 miles an hour to disperse them. The three causes of fog, according to Captain Carpenter, are (1) a warm atmosphere cooled by contact with a cold earth or water surface, which forms a cold surface fog; (2) a cold atmosphere warmed by contact with a warm earth or water surface, which forms a steaming water fog; (3) two strata of air of different temperatures in contact with one another, which conditions give rise to a cloud fog. Any of these fogs may become permeated by smoke. The fog particles become coated with oily hydro-carbons, are then impervious to the evaporating power of the sun, and may drift long distances, slowly settling on ground, houses, and clothes, and being inhaled by living animals and plants. (*Quart. Journ. Roy. Met. Soc.*, 1904, pp. 171–2.) R. DeC. W.

CLIMATE AND CHARACTER IN SCOTLAND.—The general effect upon national temperament of the climatic conditions under which man lives has often been commented on. The sunny skies of southern Europe have doubtless had an influence upon the character of the people and of the literature of that region, just as the greater prevalence of cloud in the higher latitudes of the same continent has tended to give the inhabitants and the literature of the more northern lands some of their seriousness. This same note is struck in Sir Archibald Geikie's delightful *Scottish Reminiscences*, when the author speaks of the effect of Scotch topography and of Scotch climate upon the national life and character of the Highlander:

> The gloom of the valleys is deepened by the canopy of cloud which, for so large a portion of the year, rests upon the mountain ridges and cuts off the light and heat of the sun. Hence his harvests are often thrown into late autumn, and in many a season his thin and scanty crops rot on the ground, leaving him face to face with starvation and an inclement winter. Under these adverse conditions he could hardly fail to become more or less subdued and grim.

R. DeC. W.

MAP OF THE BRITISH ORDNANCE SURVEY.—The colored 1-inch map of England which the Ordnance Survey is now publishing is a vast improvement on the sheets of the earlier series, and is one of the best examples of modern topographic methods. Villages and roads are given in great detail, so that the sheets are excellent guides for local excursions. The sheets are of various sizes, the largest costing from 2 to 3 shillings. Slopes are shown by brown hachures, heights by red contours with hundred-feet intervals, the chief highways are in ochre, the water in blue, parks in green, and cultural features in black.

A NEW MAP OF FRANCE.—The present director of the Geographical Department of the French General Staff has planned a new map of France on a scale of 1:50,000, which will replace the map of France on a scale of 1:80,000. While in the old map the mountains are shown with hachures and only black is used, the new map will give relief features in contour lines, and several colours will be used to distinguish water, roads, and cultural features. The first sheets of the new map, which will present Paris and its surroundings, will be published about the end of the year.

AFRICA.

GLACIATED SURFACES AND DEPOSITS IN THE TRANSVAAL.—A proof sheet from the Geological Society of South Africa announces the discovery by E. T. Mellor of extensive glaciated surfaces and deposits 25 miles east of Pretoria. The deposits represent the lower portion of the Highveld Formation lying immediately below the Coal Measures, and consist of irregularly-alternating conglomerates, sandstones, and shales. The conglomerates have the characters usual in ground moraines. They are boulders, miscellaneous in composition and size, embedded in a clayey, or more frequently sandy matrix, full of smaller angular rock fragments. The boulders are polished, facetted, and those which are sufficiently fine in grain are frequently striated. The sandstones are also very irregular in thickness, often massive and without traces of bedding. The shales show fine lamination, very regular over short distances. These deposits were laid down upon a land surface of considerable variety, many features of which reappear with slight modification in the landscape of to-day. Whenever the glaciated deposits are removed by erosion glaciated surfaces are of frequent occurrence. The striæ and boulders prove that the ice movement was N.N.W. to S.S.E. The wide extent of the glacial deposits, their presence at various elevations,and the parallelism and constancy of direction of the striæ indicate a considerable thickness of the ice-sheet. (*The Amer. Jour. of Sci.*, July, 1904, p. 89.)

DESICCATION OF LAKE CHAD.—Captain Lenfant, in the account of his journey by water from the mouth of the Niger to Lake Chad, recently published in *La Géographie* (BULLETIN, July, 1904, p. 429), says that Lake Chad can no longer be regarded as a vast inland sea, affording the means of brisk commercial activity between its shores. Year by year evaporation diminishes its limits, and on the border of Kanem, on the east, the islands seen by Overweg have become *terra firma*, while the sand banks spoken of by him have been transformed into islands, and the masses of floating herbage are in their turn taking the form of sand banks. Thus the traveller who stands on the old lake shore has before him three zones of islets in course of formation, ranged in regular lines and separated by channels, sometimes of great depth, and maintaining a uniform direction.

A similar phenomenon is to be noticed in the north; while in the south there are wide grass-covered banks broken by small expanses of open water. The town of Ngornu, found by Barth to be in course of rebuilding after it had been destroyed by an inundation from the lake, is now twenty miles from the shore. In the extreme east the Bahr-el-Ghazal is no longer connected with the lake, the intervening stretch having become a millet field of great fertility, thanks to the rich alluvium left by the waters.

These phenomena have curiously affected the work of the Anglo-German Boundary Commission, which has been engaged in surveying the country through which the frontier between Northern Nigeria (British) and the German hinterland of the Kamerun is to be drawn. The Commission have not been able to agree on the actual demarcation of the frontier line, because the members have different views as to where the actual shore of Lake Chad should be drawn (*Scot. Geog. Mag.*, 1904, No. 7, p. 377). The observations of the French have shown that the water of the lake is gradually receding from the eastern shore, which is fringed by an archipelago of islands, some of which are gradually becoming attached to the mainland. There is some evidence to show that simultaneously with this receding of the water there is a gradual advancement of the lake in a westerly direction. But apart from the question of any permanent shifting of the lake-bed to the west, it has been demonstrated that during the rainy season the waters of Lake Chad overflow the western shore to a breadth of some miles; and the contention of the German Commissioners is that the extreme limits of this flood-water must be regarded as the shore of the lake, while the British Commissioners assert that this flood-water cannot be regarded as a part of the lake proper.

CROSSING THE WESTERN SAHARA.—The Western Sahara between Algeria and Timbuktu has not been crossed by Europeans until recently since the days of Caillié, about 75 years ago. Several explorers have tried to cross this part of the desert, but failed. The fact that the region has again been traversed is one of the results of the French occupancy of the Tuat Oases. A military column under the command of Capt. Laperrine, at the end of May last, met an expedition travelling north from Timbuktu under the leadership of Capt. Thiévenaut at Timissâo in the heart of the desert about 22° N. Lat. These expeditions across the desert will doubtless be continued, particularly as France is planting a series of stations at the wells and in the oases. These stations are to be fitted with wireless telegraph plants, so that the French in the Sudan will no longer be dependent upon the British cable to Senegal.

SCIENTIFIC RESULTS OF THE FOUREAU MISSION.—The Paris Geographical Society has just issued, under the legacy of Renoust des Orgeries, the first number of the "Documents Scientifiques de la Mission Saharienne," by F. Foureau, Chief of the Expedition. The volume is published very handsomely by Masson & Co. It contains the astronomical and meteorological observations of the expedition, and will be followed by reports on topography, geology, biology, ethnology, and archæology. The accounts of the winds and thunder-storms and some other phenomena are especially minute. It is interesting to know that this legacy is to be applied to the aid of expeditions planned to bring the interior of Africa under the influence of France and make a homogeneous whole of her actual possessions in Algeria, Senegal, and the Congo.

THE CHEVALIER MISSION IN THE SHARI BASIN.—The expedition which left France in June, 1902, under Mr. August Chevalier, to continue the scientific study of the French Sudan between the Mobangi tributary of the Congo and Lake Chad, has returned to France after successfully carrying out its work. Mr. Chevalier has made a preliminary report, which is published in *La Géographie* (June, 1904).

The region is entirely included in the basin of the Shari River, excepting along its southern edge among the equatorial forests whose water-courses reach the Mobangi and the Congo. Midway on the journey near Fort Archambault, Chevalier met the Sara tribe, along the upper Shari, who impressed him as among the finest of African peoples. They are large and physically powerful, many of the men measuring six feet in height; while the women are also tall and strong. He says these vigorous people are much superior to most other tribes. They are laborious tillers of the soil, are ignorant of cannibalism, and their social condition is well ordered and prosperous. Most of the land they cultivate has been wrested from the forest by cutting down the timber. The explorer believes the Sara will be especially useful in the development of the country.

The entire region traversed, except the forest belt in the south, belongs to the Sudan. Chevalier believes that the Sudanese Empire of France has a future of great importance. The people are superior to other blacks, and most of them may be regarded as occupying a plane of semi-civilization. They are docile, desirous of improving their condition, and nearly all are tillers of the land which they have conquered from the forests. They raise abundant crops, never suffer from famine, and are not addicted to cannibalism. They have suffered terribly from slave raiders, who have depopulated large regions. But they need only peace and protection to increase rapidly in numbers and in prosperity.

This central part of the Sudan may be divided into three zones: The narrow forest belt on the south, where the rubber industry is capable of large development, coffee grows wild, and the kola nut may be cultivated; the middle zone, which is the most populous and most interesting, a country covered with well-tilled fields (here the cultivation of cotton is destined to become a very large industry); and, finally, the steppes of the north, extending to the desert of Sahara, where the ostrich thrives, gum arabic may be obtained in large quantities, and large numbers of people may lead a pastoral life, as the land is well adapted for grazing. France has a great opportunity to turn this vast region into a prosperous colony.

A RAILROAD FROM BERBER ON THE NILE TO SUAKIN ON THE RED SEA.—The Egyptian budget for 1904 gives information with regard to the proposed railroad between Berber and Suakin. The preliminary surveys have been made, and the cost of construction is fixed at 1,770,000 pounds Egyptian. The expenditure of this sum, divided into four annual instalments, has been authorized. The work will begin at once, and it is expected that the railroad will be in operation within four years. The effect of the road will be greatly to diminish the cost of transporting commodities to and from the Anglo-Egyptian Sudan. The only outlet by steam at present is along the Nile, where the great length of the route and several transshipments between land and water make it a very costly highway for freight. It is expected that the Berber-Suakin railroad will largely promote the development of the Sudan.

ASIA.

THE RAILROAD BETWEEN DAMASCUS AND MECCA.—A long account of the progress of this railroad appears in the *Mitteilungen* of the Vienna Geographical Society (Band XLVII, Nos. 1 and 2). The idea of building a railroad to convey pilgrims between Damascus and Mecca originated with Mehemet Izzet Pasha, the second secretary of the Sultan of Turkey, who heartily took up the project, and in July, 1900, proclaimed his intention to carry out the scheme. The length of the railroad, which will supplant one of the most thronged of the pilgrim routes, will be 1,054 miles. The section between Damascus and Amman, about 140 miles, was completed in September, 1903. The road will probably be completed to Mahan, 164 miles farther south, about the end of this year. If this expectation is fulfilled, nearly a third of the road will be completed by the end of the year.

The route extends southward from Damascus through the fruitful plateau that ends some 70 miles south of that city, thence parallel with the Jordan Valley and the Dead Sea, and 25 to 30 miles west of them to Mahan, where the line will strike off to the southeast to Medina across the red waste of northern Arabia, and thence south to Mecca.

Along the two-thirds of the route to be built after this year the difficulties may be considerable. Large sums have annually been paid to the Beduin tribes of the desert to keep them from molesting pilgrims. It remains to be seen whether their hostility and the aridity of the country will be serious obstacles. It is believed, however, that the railroad may be completed to Mecca about 1912.

The Mohammedan press has helped to arouse great interest in the project throughout Islam, which is important for its success, as the Sultan is chiefly relying on contributions to carry it out. Large sums have been given even by the Mohammedans of China, India, and the Dutch East Indies, who will never use the route, as their way to Mecca is by sea to Jedda. Islam, generally, is supporting the enterprise in a substantial manner; and in addition to these contributions the Turkish Government has imposed a special tax for building the Hedjaz railroad, and all officials and employees receiving more than 500 piastres a year must pay a very small percentage of their salaries into the fund.

Some ideas which the Sultan at first wished to carry out have been abandoned. The track is being laid as a narrow instead of a broad gauge road. The notion that only workmen and supplies from Mohammedan countries should be used was naturally abandoned. Italian and Austrian labourers are largely employed, and the whole work, of course, is under the direction of Western engineers and other experts. The plans include the improvement of the port of Haifa. The railroad that connects it with Lake Gennesaret will be extended to the Hedjaz railroad. Other feeders of the road will, in time, be built from El Akaba and Jedda on the Red Sea. The entire southern three-fourths of the line will run through an arid region, and only its Syrian portion is likely to be of considerable value for the transportation of commodities.

RELIEF MAP OF JAPAN.—Mr. Shimpei Kamase has presented to the Society's library an excellent photograph of his relief map of the Japanese Empire, which is attracting much attention in the Transportation Building at the St. Louis Exposition. This map, about 100 feet in length by 50 in width, is so large that a clear idea of relief features is given without very great exaggeration of the vertical scale. The exaggeration is threefold—sufficient, of course, to distort in some measure the mountain features, but it does not give the observer the grossly-erroneous impression of the topography that is conveyed by not a few relief models where the vertical is five to eight times as large as the horizontal scale. The map, made at Fukuoka, the home of its designer, is based upon the General Staff Map, and the results of the topographic surveys have been carefully reproduced in this miniature representation of the mountains, valleys, plains, and seas of the island empire. Every place of any importance is indicated; and the map gives a vivid idea of the remarkable development of Japan in postal, railroad, telegraph, and steamship enterprises.

TYPHOON OF OCTOBER 25–26, 1903, IN THE PHILIPPINES.—The October, 1903, *Bulletin of the Philippine Weather Bureau* brings an account of the typhoon of October 25–26, which passed centrally over Tuguegarao (Lat. 17° 35′ N., Long. 121° 39′ E.), and almost completely destroyed that place. The observer, after two rooms of his house had been carried away by the wind, took the barometer to the parochial residence, "where the stone walls of the house offered a more secure place for it," and there continued to take readings throughout the continuance of the storm. The "eye" of the storm reached the station at 7.52 P.M., and lasted about six or eight minutes. The wind changed from northwest in front of the vortex to southwest behind it. A partial summary of the observations during this interesting storm is as follows:

DATE.	BAROMETER.	DIRECTION.	WIND FORCE (0–12).	RAIN.	REMARKS.
Oct. 25.					
3.00 P.M.	29.236 ins.	N.	11	—	Sky overcast.
4.00 "	29.181 "	N.	12	—	" "
5.00 "	29.059 "	N. N. W.	12	8.82 ins.	" "
6.35 "	28.724 "	N. W. by N.	12	—	Storm at its height.
7.00 "	28.547 "	N. W.	12	—	" " "
7.45 "	28.362 "	N. W.	12	—	" " "
7.52 "	—	—	—	—	Calm of the vortex; wind swinging round to the west; blowing furiously and becoming steady from S.W.
8.00 "	—	—	—	—	Barometer starts rising.
9.00 "	28.949 "	S. W.	12	—	Wind continues with some violence.
11.00 "	29.189 "	S. W.	11	—	Storm decreasing.
Oct. 26.					Rainbow stretching from S. W. to N. W.
6.00 A.M.	29.468 "	S.	4	—	

R. DeC. W.

The British Expedition into Tibet and the Effects of the Altitude.—The British expedition into Tibet has met with some of the difficulties which could easily have been foretold by any one at all acquainted with the natural effects of the cold and of the diminished pressure on the Tibetan plateau. The London *Times*' special correspondent (quoted in *Nature*, Vol. 69, 1904, 540) has recently called attention to some of these difficulties. A temperature of −26° Fahr. was recorded at one encampment (Chuggia, on the Tang-la). The normal night minimum during January and February is probably −10° for 15,000 feet of altitude in that region. Indigestion has been common among the men on account of their eating improperly-cooked food. At 15,000 feet it was found almost impossible to boil rice properly, and of the five different kinds of lentil supplied to the troops only one was capable of being cooked at all at heights above 10,000 feet. A second quotation from the London *Times* is to the following effect:

> Any tiro in physical science could have told the military authorities that at 15,000 feet above the sea oil ceases to be a lubricant and becomes a clog. Also that the temperature of water boiling in an open vessel falls roughly two degrees Fahrenheit for every 1,000 feet you ascend. He could also have given the remedy in both cases. Our men ought to have had pure glycerine to lubricate the locks of their rifles and Maxims. They ought to have had cooking-pots with air-tight lids furnished, with safety valves blowing off at a pressure of fifteen pounds on the square inch. Then

they would have had no trouble with their rifles or cooking. The tiro could also have pointed out that the elasticity of springs, and especially of certain kinds of springs, is greatly affected by temperature, and that it would have been well to test the Maxims at such temperatures as they would certainly have to encounter.

R. DeC. W.

NOTES ON THE CLIMATE OF ARABIA AND ALONG THE PERSIAN GULF.—Mr. David G. Fairchild, of the Department of Agriculture, who was recently sent to Arabia and Persia in order to secure the best varieties of date plants for use in Arizona, contributes to the *National Geographic Magazine* (Vol. XV, 1904, 139–151) an illustrated article giving an account of his journey. Several interesting notes on climate are included. Along the shores of the Persian Gulf the winter season is the only part of the year when life is at all comfortable. At this time (December 1–April 15) the climate resembles that of the deserts of California or the winter climate of Egypt. At Muscat a temperature of 110° at 4 A. M. is stated to be frequently recorded, and

> the few Europeans who are doomed to live there succeed in making life bearable by means of specially constructed fanning machines, which blow the air through wetted screens of grass roots.

In order to avoid the heat of the summer, it is the custom for the wealthy natives, as well as for Europeans, to spend as much of the day as possible in the innermost recesses of their houses, with every opening which might admit the hot air closed and darkened. It is the prevailing custom to sleep on the roofs or upper verandas. Regarding the agricultural possibilities of the country through which the projected railway from Aleppo to Bagdad and the Gulf is to pass, Mr. Fairchild believes that there is no climatic obstacle to human settlement, the winters being pleasant and the summers no warmer than in the desert regions of the southwestern United States. Irrigation will, of course, be necessary, but where irrigation is possible, the scheme of attracting settlers does not seem chimerical. Mr. Fairchild is of the opinion that plants which grow in the Nile Valley and in Arizona and southern California would grow satisfactorily in this part of Persia. Cotton could probably also be raised there, and some varieties of wheat. The possibilities of stock-raising will depend upon the amount of alfalfa or of other crops which can be successfully grown there. An interesting consequence of the absence of trees, and hence of lumber, along the shores of the Persian Gulf, is seen in the construction of the boats, which are made of the mid-ribs of the leaves of the date-palm.

R. DeC. W.

VARIATION OF RAINFALL AND POPULATION IN INDIA.—Mr. W. L. Dallas, of the Meteorological Department of India, contributed a paper on "The Variation of the Population of India Compared with the Variation of Rainfall in the Decennium 1891–1901," at the April meeting of the Royal Meteorological Society, in London. The author showed that during the four years 1891–5 the rainfall was generally normal or heavy over nearly the whole of India, and during the six years 1895–1901 the rainfall was greatly deficient. During the former, or "wet" period, the rainfall was deficient over Upper Burma and Madras, was normal over the remainder of Burma, Assam, Bengal, and the west coast of the Peninsula, and was excessive elsewhere; while during the latter, or "dry" period, the rainfall was again deficient over Upper Burma, normal or excessive over the remainder of Burma, Assam, Bengal, the United Provinces, the Northwest Frontier Province, and the south of Madras, and was deficient elsewhere—most so over Rajputana and the neighbouring areas.

The general census of India, taken on March 1st, 1901, showed the total population to be 293,475,477, which, excluding the territories not included in the census of 1891, was an increase of only 1.3 per cent. The population has thus failed to increase according to the normal rate during the decade. Part of this failure was no doubt due to epidemics, but the author shows that there is an unmistakable relationship between the variations of the population and the variations of rainfall during the six dry years. The area within which the most serious decrease of population occurred coincides almost exactly with the area of greatest deficiency of rainfall.

R. DEC. W.

POLAR REGIONS.

BAD ICE CONDITIONS IN BARENTS SEA.—A cablegram from W. S. Champ, who is trying to carry supplies on the steamer *Frithjof* to the Siegler-Fiala Arctic Expedition in Franz Josef Land, announced on Aug. 1st that he had been unable to find an opening in the ice of the Barents Sea. He said, however, that the ice conditions were then more favourable, and his party would sail again from Vardö and try to reach Franz Josef Land this season.

Since the archipelago was discovered in 1873 the round trip across these waters has often been made by steamers in a single season. The sea is sometimes almost entirely free from ice, but at other times it is covered with heavy floe-ice, through which it is impossible to force a way. It is unfortunate for Mr. Ziegler's polar enterprise that the past three seasons have been very bad years in Barents Sea. It is unusual for the sea to be ice-choked for so long a time.

The Fiala Expedition of last year may have reached Franz Josef Land, though nothing has been heard of it. Its vessel, the *America*, set out for the Arctic on July 10th, last year, from Vardö, on the north coast of Norway. When west of Novaya Zemlia, the expedition reached the edge of the ice-pack and followed east for many miles, vainly looking for a lead through which to push north. On June 20th the *America* fell in with a sealer bound for Norway, and Fiala sent by this vessel the last information he had an opportunity to despatch. He said he was about to turn westward and follow the ice-edge towards Spitzbergen, in the hope of finding an opening to the north in that direction. His hope was evidently realized, but his further fortunes are problematical. He may have been lucky enough to reach Franz Josef Land last autumn, but if so it was too late for the *America*, according to the plan, to return to Norway that season. Considering the ice conditions, we need not be surprised to hear that the vessel was frozen in the pack, and spent last winter helpless in the ice between Franz Josef Land and Europe.

If the expedition was adrift all last winter, its plans for establishing supply stations in the Far North for the benefit of the sledge party which was to make a dash for the pole early this year must, of course, have been defeated. Such delay would require at least another year in the Arctic to give the northern sledge journey the best possible chance for success. If Mr. Champ has the good luck to reach Franz Josef Land this fall, he cannot possibly return this season, and so no news from the two parties is to be expected until next year.

THE SCOTTISH ANTARCTIC EXPEDITION.—On July 21 the *Scotia*, with the members of the Scottish National Antarctic Expedition, arrived home. In advance of the detailed report of the second year's work of the *Scotia*, it may be said that in February last the vessel returned to the South Orkneys from Buenos Aires, where she had gone to coal and refit. She then continued her explorations in the Weddell Sea, south of the Atlantic. The expedition reached 74° 1′ S. Lat., 22° W. Long., and was there stopped by the ice, remaining fast for a week. After getting free the vessel coasted for more than 100 miles along what the expedition believes to be the Antarctic Continent, which thus lies some 600 miles north of the position in which it has been supposed to lie. Crossing Ross's Deep, which proves to be 2,600 fathoms where Ross marked "4,000 fathoms, no bottom," the *Scotia* sailed northward to Gough Island, where a party landed for the first time. It is believed that the collections made on this island will prove of great scientific importance. Thence the *Scotia* sailed to the Cape and home.

Sir John Murray, in presenting the gold medal of the Royal Scottish Geographical Society to Mr. Bruce, the leader of the expedition, emphasized in his speech three points of importance in regard to its work: First, that the *Scotia* had penetrated 300 miles further into the Antarctic than the vessel of any other recent expedition; second, that the expedition had discovered the Antarctic Continent in a position where it was not previously known to exist; and third, that it had accomplished a large amount of accurate oceanographical work.

A NEW POLAR PROJECT.—Mr. Charles Bénard described a new scheme for a North Polar Expedition at a meeting of about fifty scientific men, held in the house of the Prince of Monaco in Paris on June 19. Mr. Bénard gave his reasons for believing that the only feasible and rational route of penetration of the Polar Sea was one a little north and east of that followed by the *Fram*. He said the expedition should start from a Norwegian port, cross the southern part of Barents Sea, take in dogs at Karadora, sail along the coast of Yalmal, and arrive at the end of autumn at the New Siberia Islands. It should not then go north, as did the *Fram*, but should manage at all costs, even if it were necessary to winter at Bennett Island, to reach a point on the meridian of 150° E. Long. From that point the ship or ships need only drift in the ice to cross the North Pole.

Mr. Bénard urged the utility of sending an expedition composed of two vessels in touch with each other by means of wireless telegraphy. The expedition should be provisioned for five years, but would not probably be in the field more than three years. The gentlemen present signed a memorandum declaring the expedition to be of scientific utility. It would cost about $240,000, and, according to the French press, there is some prospect that the expedition, under the stimulus of the Prince of Monaco, will be organized.

To complete North Polar exploration Mr. Bénard advocates not only such costly expeditions into the unknown Arctic seas, but also annual journeys to study smaller areas, after the manner in which the

Danes have carried on the exploration of Greenland for the past thirty years, with important results. They have thoroughly surveyed and studied the coasts and the ice-free coastal lands from 72° N. on the east coast to 77° N. on the west side of the island.

AUSTRALIA.

CARRYING LIVE FISH TO THE SOUTH PACIFIC.—The Report of the Fish Commission of New South Wales for 1902 describes a successful attempt to transplant sea-fish from the coasts of Scotland to the waters of the Southern Pacific. None of the leading food fishes of the north Atlantic, such as the cod, herring, turbot, and plaice, are found in the ocean off the coasts of Australia. Experiments with the transportation of fish ova failed, and it was therefore decided to try to introduce young or nearly mature fish, experimenting at first on a small scale.

The plaice, one of the principal flat fishes in the British market and a hardy animal of wide distribution, was selected for the first experiment. Seven hundred and twenty-two of them were placed in tanks in a fish chamber built on the deck of a steamer which started for Sydney, 12,342 miles away, on June 21. The temperature of the water in the tanks at the start was just right at 58°. After warmer latitudes were reached the water in the tanks, which was very frequently changed, was artificially cooled.

After a journey of about five weeks 640 of the fish arrived at Sydney in very good order, though their nature had become somewhat changed, as they had lived for two and a half months in absolute inactivity and were more or less domesticated. They were turned loose in a large enclosure of the waters at Fort Hacking, about eighteen miles down the coast, where they were shielded from strong tides and had favourable conditions for adapting themselves to the environment of Australian waters. It is believed to have been found practicable to transport European sea fishes to these waters, and if some of the best varieties prove to be adapted to the conditions of the Southern Pacific the value of the fishery resources will be much enhanced. At last accounts the fish seemed to be thriving.